FEMA 209: 176 186

ORIGINAL

FLOOD INSURANCE STUDY

VILLAGE OF KIRKLAND,
ILLINOIS

Federal Emergency Management Agency

NOTICE TO
FLOOD INSURANCE STUDY USERS

Communities participating in the National Flood Insurance Program (NFIP) have established repositories of flood hazard data for floodplain management and flood insurance purposes. This Flood Insurance Study (FIS) may not contain all data available within the repository. It is advisable to contact the community repository for any additional data.

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South Branch Kishwaukee River Panel 01P

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FLOOD INSURANCE STUDY

VILLAGE OF KIRKLAND, DE KALB COUNTY, ILLINOIS

1.0 INTRODUCTION

1.1 Purpose of Study

This Flood Insurance Study investigates the existence and severity of flood hazards in the Village of Kirkland, De Kalb County, Illinois, and aids in the administration of the National Flood Insurance Act of 1968 and the Flood Disaster Protection Act of 1973. This study has developed flood risk data for various areas of the community that will be used to establish actuarial flood insurance rates and assist the community in its efforts to promote sound floodplain management. Minimum floodplain management requirements for participation in the National Flood Insurance Program are set forth in the Code of Federal Regulations at 44 CFR, 60.3.

In some states or communities, floodplain management criteria or regulations may exist that are more restrictive or comprehensive than the minimum Federal requirements. In such cases, the more restrictive criteria take precedence and the state (or other jurisdictional agency) will be able to explain them.

This Flood Insurance Study was prepared by compiling existing hydrologic and hydraulic technical and scientific data prepared originally for purposes other than the National Flood Insurance Program. The data were identified as the best available at the time of compilation of this Flood Insurance Study and should depict the general conditions of the flooding sources with relative accuracy. The Federal Emergency Management Agency (FEMA) performed a cursory review and accepted the data as valid for purposes of this Flood Insurance Study and the National Flood Insurance Program. However, if better information is known to exist or has been developed since the date of this report, the information should be immediately forwarded to the Natural and Technological Hazards Division, FEMA, Chicago, Illinois, for consideration for revision of this study.

1.2 Authority and Acknowledgments

The sources of authority for this Flood Insurance Study are the National Flood Insurance Act of 1968 and the Flood Disaster Protection Act of 1973.

The hydrologic and hydraulic analyses for this study were obtained from "South Branch Kishwaukee River Flood Plain Information, De Kalb County, Illinois," and "Flood Plain Management Reconnaissance Study Report, Kirkland, De Kalb County" (References 1 and 2).

1.3 Coordination

On September 15, 1986, the results of this Flood Insurance Study were reviewed and accepted at a final coordination meeting attended by representatives of the community and FEMA.

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2.0 AREA STUDIED

2.1 Scope of Study

This Flood Insurance Study covers the incorporated area of the Village of Kirkland, De Kalb County, Illinois. The area of study is shown on the Vicinity Map (Figure 1).

The areas studied by detailed methods were selected based on the extent and validity of available existing hydrologic and hydraulic data.

A portion of the flooding caused by overflow of South Branch Kishwaukee River was studied in detail within the community.

Approximate methods of analysis were used to study all remaining areas having a potential flood hazard that did not have detailed scientific or technical data available.

Bull Run and the remaining portion of the flooding from the South Branch Kishwaukee River were studied by approximate methods.

2.2 Community Description

The Village of Kirkland is located in northern Illinois and is bordered by the unincorporated areas of De Kalb County. State Route 72 and the Chicago Milwaukee St. Paul & Pacific Railroad serve Kirkland. The population of Kirkland was reported to be 1,155 in 1980 (Reference 3).

The topography of the area is rolling with long slopes. Soil types within Kirkland include Plano, Elburn, Batavia, Harvard, Octogon, Saybrook, Drummer, Flanagan, Sawmill, Camden, Miami, Dodge, and Millbrook. Cultivated cropland extends throughout most of Kirkland.

Rainfall for the area is approximately 35 inches per year. Due to the rural nature of Kirkland, there is very little development in the floodplain.

2.3 Principal Flood Problems

Flooding is somewhat common in the Village of Kirkland, with major floods occurring on January 24, 1938; October 12, 1954; February 10, 1966; June 2, 1970; and July 3, 1983. Ice and log jams are factors that can aggravate flooding within the study area.

2.4 Flood Protection Measures

Flood protection measures are not known to exist within the study area.

3.0 ENGINEERING METHODS

For the flooding sources studied in detail in the community, standard hydrologic and hydraulic study methods were used to determine the flood hazard data required for this study. Flood events of a magnitude that are expected to be equaled or exceeded once on the average during any 10-, 50-, 100-, or 500-year period

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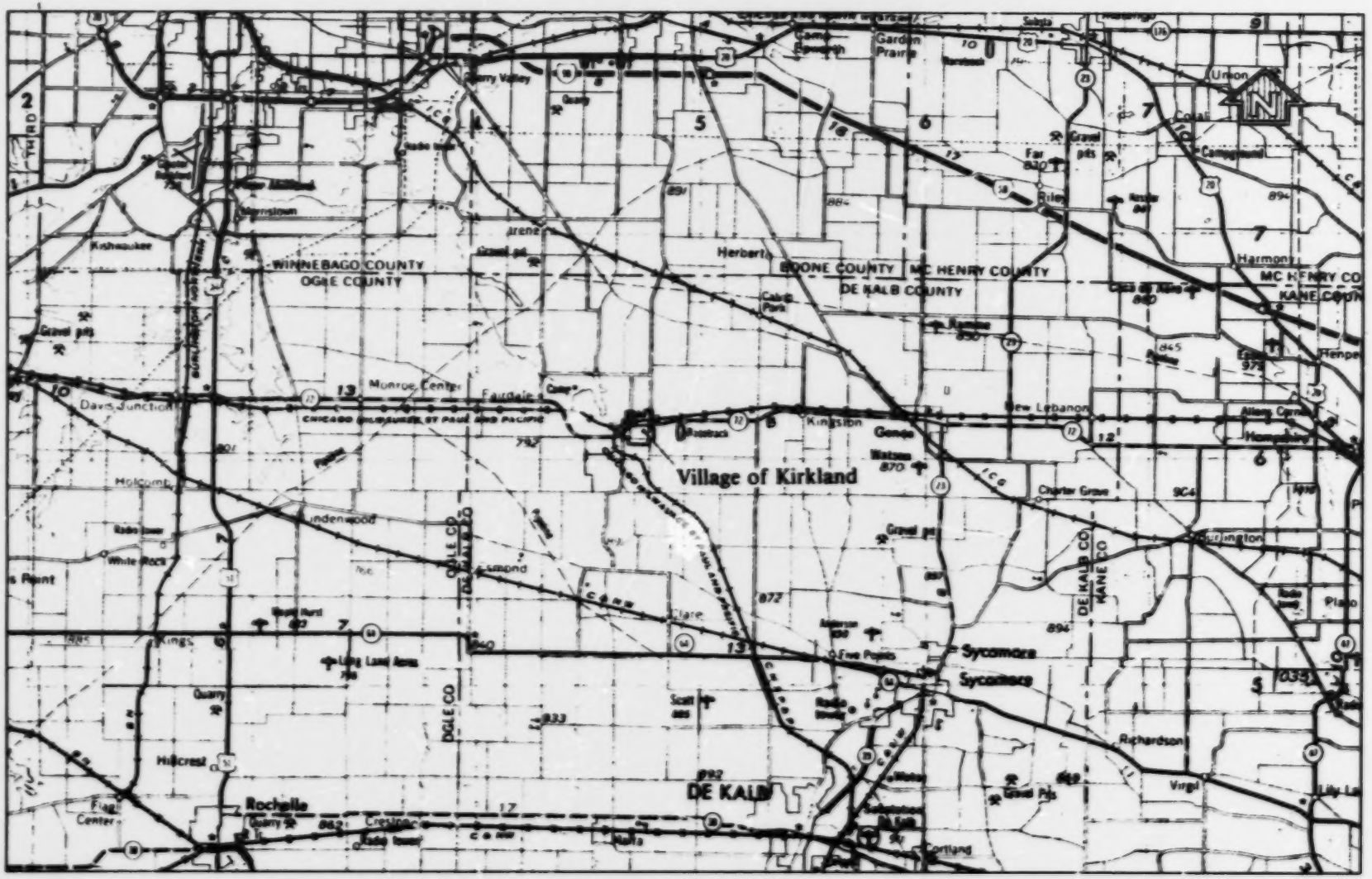

FIGURE 1

FEDERAL EMERGENCY MANAGEMENT AGENCY

VILLAGE OF KIRKLAND, IL

(DE KALB CO.)

APPROXIMATE SCALE

4 0 4 8 12 MILES

VICINITY MAP

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(recurrence interval) have been selected as having special significance for floodplain management and for flood insurance rates. These events, commonly termed the 10-, 50-, 100-, and 500-year floods, have a 10-, 2-, 1-, and 0.2-percent chance, respectively, of being equaled or exceeded during any year. Although the recurrence interval represents the long-term average period between floods of a specific magnitude, rare floods could occur at short intervals or even within the same year. The risk of experiencing a rare flood increases when periods greater than 1 year are considered. For example, the risk of having a flood that equals or exceeds the 100-year flood (1-percent chance of annual exceedence) in any 50-year period is approximately 40 percent (4 in 10), and, for any 90-year period, the risk increases to approximately 60 percent (6 in 10). The analyses reported herein reflect flooding potentials based on conditions existing in the community at the time of completion of this study. Maps and flood elevations will be amended periodically to reflect future changes.

3.1 Hydrologic Analyses

Hydrologic analyses were carried out to establish the peak discharge-frequency relationships for each riverine flooding source studied in detail affecting the community.

Peak discharge-frequency relationships were established through frequency analysis of gaging stations in accordance with U.S. Water Resources Council Bulletin No. 17 (Reference 4).

Peak discharge-drainage area relationships for the 10-, 50-, 100-, and 500-year floods of each flooding source studied in detail in the community are shown in Table 1.

TABLE 1 - SUMMARY OF DISCHARGES

FLOODING SOURCE AND LOCATION	DRAINAGE AREA (SQ MILES)	PEAK DISCHARGE (CFS) 100-YEAR
SOUTH BRANCH KISHWAUKEE RIVER		
at Ogle-De Kalb county line	402	14,300

3.2 Hydraulic Analyses

Analyses of the hydraulic characteristics of flooding from the sources studied were carried out to provide estimates of the elevations of floods of the selected recurrence intervals.

Cross-section data and dimensions of backwater-producing structures were obtained through field surveys.

Locations of selected cross sections used in the hydraulic analyses are shown on the Flood Profiles.

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The water-surface profile of the 100-year flood for the detailed study stream was computed using the U.S. Army Corps of Engineers HEC-2 step-backwater computer program (Reference 5).

The flood profile was drawn showing the computed water-surface elevations of the 100-year flood.

The hydraulic analyses for this study are based only on the effects of unobstructed flow. The flood elevations shown on the profiles are thus considered valid only if hydraulic structures remain unobstructed, operate properly, and do not fail.

All elevations are referenced to the National Geodetic Vertical Datum of 1929 (NGVD).

4.0 FLOODPLAIN MANAGEMENT APPLICATIONS

The National Flood Insurance Program encourages state and local governments to adopt sound floodplain management programs. Therefore, each Flood Insurance Study provides 100-year flood elevations and delineations of the 100- and 500-year floodplain boundaries and 100-year floodway to assist communities in developing floodplain management measures.

4.1 Floodplain Boundaries

To provide a national standard without regional discrimination, the 1-percent annual chance (100-year) flood has been adopted by FEMA as the base flood for floodplain management purposes. The 0.2-percent annual chance (500-year) flood is employed to indicate additional areas of flood risk in the community. For each stream studied in detail, the 100-year floodplain boundary has been delineated using the flood elevations determined at each cross section. Between cross sections, the boundary was interpolated using topographic maps at a scale of 1:4800 with a contour interval of 2 feet (Reference 6).

The 100-year floodplain boundary is shown on the Flood Insurance Rate Map. On this map, the 100-year floodplain boundary corresponds to the boundary of the areas of special flood hazards (Zones A, AE, AH, AO, A99, V, and VE). Small areas within the floodplain boundaries may lie above the flood elevations but cannot be shown due to limitations of the map scale and/or lack of detailed topographic data.

For the streams studied by approximate methods, only the 100-year floodplain boundary was delineated using the "Flood Plain Management Reconnaissance Study Report, Kirkland, De Kalb County" (Reference 2).

4.2 Floodways

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 100-year flood can be carried without substantial increases in flood heights.

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A floodway was not determined because it was not in the scope of the report.

5.0 INSURANCE APPLICATION

For flood insurance rating purposes, flood insurance zone designations are assigned to a community based on the results of the engineering analyses. These zones are as follows:

Zone A

Zone A is the flood insurance rate zone that corresponds to the 100-year floodplains that are determined in the Flood Insurance Study by approximate methods. Because detailed hydraulic analyses are not performed for such areas, no base flood elevations or depths are shown within this zone.

Zone AE

Zone AE is the flood insurance rate zone that corresponds to the 100-year floodplains that are determined in the Flood Insurance Study by detailed methods. Whole-foot base flood elevations derived from the detailed hydraulic analyses are shown at selected intervals within this zone.

Zone X

Zone X is the flood insurance rate zone that corresponds to areas outside the 500-year floodplain, areas within the 500-year floodplain, areas of 100-year flooding where average depths are less than 1 foot, areas of 100-year flooding where the contributing drainage area is less than 1 square mile, and areas protected from the 100-year flood by levees. No base flood elevations or depths are shown within this zone.

6.0 FLOOD INSURANCE RATE MAP

The Flood Insurance Rate Map is designed for flood insurance and floodplain management applications.

For flood insurance applications, the map designates flood insurance rate zones as described in Section 5.0 and, in the 100-year floodplains that were studied by detailed methods, shows selected whole-foot base flood elevations or average depths. Insurance agents use the zones and base flood elevations in conjunction with information on structures and their contents to assign premium rates for flood insurance policies.

For floodplain management applications, the map shows by tints, screens, and symbols the 100-year floodplain, and the locations of selected cross sections used in the hydraulic analyses and floodway computations.

7.0 OTHER STUDIES

A Flood Insurance Study has been completed for the Unincorporated Areas of De Kalb County (Reference 7). The results of this study agree with the De Kalb County study, except for some areas of approximate flooding, in which case this study supersedes the De Kalb County study.

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Due to its more detailed analysis, this Flood Insurance Study supersedes the previously printed Flood Hazard Boundary Map for the Village of Kirkland (Reference 8).

8.0 LOCATION OF DATA

Information concerning the pertinent data used in the preparation of this study can be obtained by contacting the Natural and Technological Hazards Division, FEMA, 300 South Wacker Drive, Chicago, Illinois 60606.

9.0 REFERENCES AND BIBLIOGRAPHY

1. U.S. Army Corps of Engineers, Rock Island District, South Branch Kishwaukee River Flood Plain Information, De Kalb County, Illinois, June 1971.

2. U.S. Department of Agriculture, Soil Conservation Service, Flood Plain Management Reconnaissance Study Report, Kirkland, De Kalb County, December 1984.

3. U.S. Department of Commerce, Bureau of the Census, 1980 Census of Population, Number of Inhabitants, Illinois, Washington, D.C., February 1982.

4. U.S. Water Resources Council, Bulletin No. 17, Guidelines for Determining Flood Flow Frequency, March 1976.

5. U.S. Army Corps of Engineers, Hydrologic Engineering Center, HEC-2 Water-Surface Profiles Generalized Computer Program, Davis, California, November 1976.

6. ————, Rock Island District, Illinois, Topographic Map of Flooded Area, South Branch Kishwaukee River, Scale 1:4800, Contour Interval 2 feet: De Kalb County, Illinois, June 1971.

7. Federal Emergency Management Agency, Flood Insurance Study, De Kalb County, Unincorporated Areas, Illinois, September 1985.

8. U.S. Department of Housing and Urban Development, Federal Insurance Administration, Flood Hazard Boundary Map, Village of Kirkland, De Kalb County, Illinois, May 1974.

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FLOOD PROFILES

SOUTH BRANCH KISHWAUKEE RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

VILLAGE OF KIRKLAND, IL

(DE KALB CO.)

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